UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,378	08/24/2001	Ronaldus Maria Aarts	NL000467	1555

24737 7590 05/16/2005

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
CHANG, EDITH M	
ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 05/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/938,378	AARTS, RONALDUS MARIA	
	Examiner	Art Unit	
	Edith M. Chang	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-5,7-9,12,15 and 16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3,5,7,9,12,15 and 16* is/are rejected.

7)☒ Claim(s) *4,8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments/Remarks

1. Applicant's arguments filed February 18, 2005 have been fully considered but they are not persuasive.

Argument: Applicant argues that the limitation "the gain for small amplitude signals is substantially equal to one for small amplitudes, and wherein the gain decreases for large amplitudes" is not taught in the references.

Response: It is well known in the art that the quantizer provides the quantizing function with its quantizing steps, and the small amplitudes have smaller quantizing steps, the larger amplitudes have larger quantizing steps (in turns, the gain decreases in larger amplitudes) especially for audio signal. Todd et al. teaches the quantizing function of the audio signal in FIG.3, 4 & 7 with quantizing steps and the function gain. Heddle teaches (or specify the detail of) the non-linear quantizing function in FIG.9 (column 7 lines 14-17) wherein the gain is substantially equal to one for smaller amplitudes (x) and the gain decreases for larger amplitudes. Hence the references teach the limitation.

Argument: Applicants argues that the limitation "recoding the reduced word-length signal, the non-linear device parameters and the noise parameters on a recoding medium" does not taught by the references.

Response: Nishio et al. teaches the reduced word-length dithered signal recorded on a compact disk FIG.14 (column 11 line 65-column 12 line 8). As Todd's encoder and decoder with

dither method for audio signals, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to store the Todd's audio signal in the CD using the Nishio et al.'s method that the audio signal as the reduced word-length signal with the non-linear parameters (provided by the quantizing), and the noise (provided by the dithering). The method claim recites the steps or actions of the invention; the descriptive material (signals, noise, etc.) stored by steps or actions is not inventive subject matter.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 3, 5, 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Todd et al. (US 5,402,124) in view of Heddle (US 5,946,652).

To claims 3, 5, 12 & 16, Todd teaches the signal processing apparatus and its method in FIG.10 and FIG.11. In FIG.10, a *pseudo random number generator* and an *adder* comprised in the DITHERER (element 110 FIG.10, column 8 lines 22-25) providing the noise/dither component added to the 8 bits PCM digital from the FILTER BANK (element 108 FIG.10 column 6 line 25-30 & column 8 lines 20-22), wherein the dithering is adding in a random noise (column 3 lines 38-45) generated from the ditcher noise generator/PN generator (column 8 lines 22-25) with the defined parameters (column 9 lines 15-24 where defined the parameters), to provide the intermediate signal, the output of the DITHERER; the *QUANTIZER* (element 112 of

FIG.10) as the first quantising element receives the intermediate signal produced by adding the dither component/noise to the digital signal from the DITHERER and quantizes the 8 bits PCM signal of the intermediate signal to the 3 bits representation. The quantizing is a non-linear function defined by the non-linear device parameters such as the quantizing levels (represented by 3 bits) shown in FIG.7 and stated in column 2 lines 17-30, wherein the quantizing representative is 3 bits less than the 8 bits signal before the quanitzing.

In FIG.9c and column 7 lines 28-30, Todd teaches smaller quantisation step for small amplitudes. Todd teaches the amplitude of the noise signal generated for the dither component is fixed as the pseudo random number or by shaping techniques such as amplitude probability density function and spectral shapes stated in column 9 lines 15-24.

Todd does not explicitly specify/detail the gain of the qunatizing function. However Heddle shows the quatizing function in FIG.4, FIG.5 and column 3 lines 20-25. As Todd teaches the non-linearly quantizing and dequantizing small amplitude signals, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to addopt the well know quantizing function that the smaller amplitude signal has the gain substantially equaling to unit and the larger amplitude signal having decreased gain (as shown in the FIG.4 and FIG.5 of Heddle) in Todd's quantizing function to distributing the quantizing values non-uniformly for the purpose of get better accurate quantizing result.

4. Claims 7, 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Todd et al. (US 5,402,124) in view of Nishio et al. (US 5,774,842).

To claim 7, Todd teaches the signal processing apparatus and its

method in FIG.10 and FIG.11. In FIG.10, a *pseudo random number generator* and an *adder* comprised in the DITHERER (element 110 FIG.10, column 8 lines 22-25) providing the noise/dither component added to the 8 bits PCM digital from the FILTER BANK (element 108 FIG.10 column 6 line 25-30 & column 8 lines 20-22), wherein the dithering is adding in a random noise (column 3 lines 38-45) generated from the ditcher noise generator/PN generator (column 8 lines 22-25) with the defined parameters (column 9 lines 15-24 where defined the parameters), to provide the intermediate signal, the output of the DITHERER; the *QUANTIZER* (element 112 of FIG.10) as the first quantising element receives the intermediate signal produced by adding the dither component/noise to the digital signal from the DITHERER and quantizes the 8 bits PCM signal of the intermediate signal to the 3 bits representation. The quantizing is a non-linear function defined by the non-linear device parameters such as the quantizing levels (represented by 3 bits) shown in FIG.7 and stated in column 2 lines 17-30, wherein the quantizing representative is 3 bits less than the 8 bits signal before the quanitzing. In FIG.9c and column 7 lines 28-30, Todd teaches smaller quantisation step for small amplitudes.

Todd does not explicitly specify the recording medium, however Nishio teaches thedithered signal in the recording medium in FIG.14, FIG.15 and column 11 line 57-column 12 line 8. As Todd's encoder and decoder with dither method for audio signals (column 1 lines 5-12), and Nishio teaches the encoded dithered signal recorded on a recording medium such as CD (compact disk) show in FIG.14, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Todd's encoded audio signal recorded in a CD taught by Nishio for the purpose to provide a method and apparatus to have a good sound quality in the recording medium (column 3 lines 5-10).

To claim 9, Todd teaches the signal processing apparatus and its method in FIG.10 and FIG.11. In FIG.10, a *pseudo random number generator* and an *adder* comprised in the DITHERER (element 110 FIG.10, column 8 lines 22-25) providing the noise/dither component added to the 8 bits PCM digital from the FILTER BANK (element 108 FIG.10 column 6 line 25-30 & column 8 lines 20-22), wherein the dithering is adding in a random noise (column 3 lines 38-45) generated from the ditcher noise generator/PN generator (column 8 lines 22-25) with the defined parameters (column 9 lines 15-24 where defined the parameters), to provide the intermediate signal, the output of the DITHERER; the *QUANTIZER* (element 112 of FIG.10) as the first quantising element receives the intermediate signal produced by adding the dither component/noise to the digital signal from the DITHERER and quantizes the 8 bits PCM signal of the intermediate signal to the 3 bits representation. The quantizing is a non-linear function defined by the non-linear device parameters such as the quantizing levels (represented by 3 bits) shown in FIG.7 and stated in column 2 lines 17-30, wherein the quantizing representative is 3 bits less than the 8 bits signal before the quanitzing. In FIG.9c and column 7 lines 28-30, Todd teaches smaller quantisation step for small amplitudes.

Todd does not explicitly specify the recording medium, however Nishio teaches thedithered signal in the recording medium in FIG.14, FIG.15 and column 11 line 57-column 12 line 8; and in FIG.8, Nishio teaches a noise reduction method and apparatus with the difference signal provided by element 12, the difference of the quantized signal from element 11 and intermediate signal from the adder 10. As Todd's encoder with dither method for reducing quantizing noise, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the noise reduction apparatus and method taught by Nishio in Todd's

encoder for the purpose of reducing qunatizing errors and to provide high quality sound signal (column 3 lines 5-10).

To claim 15, in FIG. 11, Todd teaches a signal decoding apparatus for recovering an output signal without specifying the recoding medium to provide the reduced-word signal, however Nishio teaches thedithered signal in the recording medium in FIG.14, FIG.15 and column 11 line 57-column 12 line 8. As Todd's encoder and decoder with dither method for audio signals (column 1 lines 5-12), and Nishio teaches the encoded dithered signal recorded on a recording medium such as CD (compact disk) show in FIG.14, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Todd's encoded audio signal recorded in a CD taught by Nishio for the purpose to provide a method and apparatus to have a good sound quality in the recording medium (column 3 lines 5-10).
The modified/combined Todd's apparatus decodes the signal stored in the CD taught with Nishio' teaching comprising the deformatter 204 (FIG.11 '124) to extract the stored reduced-word length signal; the DEQUANTIZER 208 to perform the inverse function of the QUANTIZER (element 112 of FIG.10) to get the 8 bit digital signal with the dither component, the DITHERER 210 (as the subtraction element) with a second dither/PN generator providing the dither component/noise (element 210 of FIG.11) to perform the complementarily the DITHERER of encoder did (column 9 lines 30-40) on the signal from DEQUATIZER.

Allowable Subject Matter

5. Claims 4 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest, alone or in a combination, among other things, at least a signal processing apparatus for reducing the number of bits of a digital input signal and its method as a whole, the combination of elements and features, which includes the first transfer function for quantizing as a tanh function = $c_1 \tanh (c_2 D_i + c_3)$; and the reduced word length signal recorded on a first channel and the non-linear parameters and the noise parameters recorded on a second channel of a compact disc.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M. Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang
May 11, 2005

TEMESGHEN GHEBRETINSAE
PRIMARY EXAMINER
5/12/05